इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 1884 (1993): Automotive vehicles - Electric horns [TED 11: Automotive Electrical Equipment]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS 1884 : 1993
(Reaffirmed 2003)

भारतीय मानक

स्वचल वाहन – बिजली के हार्न – विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

AUTOMOTIVE VEHICLES — ELECTRIC HORNS — SPECIFICATION

(Third Revision)

First Reprint JUNE 2007
(Including Amendment No 1 & 2)

UDC 629·113·018·2 : 654·922·2-83

© BIS 1993

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

July 1993 Price Group 6

Automotive Electrical Equipment Sectional Committee, TED 11

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Electrical Equipment Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first issued in 1961 and was revised in 1970. The second revision of this standard was published in 1981 and it enlarged the scope to cover horns for mopeds and three wheelers also.

Electric horn is an essential safety feature fitment on all vehicles. In this third revision, the technological advancement in the field has been taken into consideration and the following modifications have been done:

a) Incorporation of amendments.

b) 12 V ac, high frequency type horns included.

c) Dimensional details shall be as per agreement between manufacturers and purchasers.

d) Typical illustrations of horns together with dimensions given have been shown for purposes of guidance only. Any other type of horns or their mountings shall depend upon mutual agreement between manufacturer and purchaser.

In the preparation of this standard, assistance has been derived from:

JIS D 5701-1982 Electric horns for automobiles.

ECE Regulation No. 28 Uniform provisions concerning the approval of audible warning devices and of motor vehicles with regard to their audible signals.

EEC Directives No. ECE/70/388 Audible warning devices for motor vehicles.

ISO 512 : 1979 Road vehicles — Signalling devices — Technical specification, issued by International Organization for Standardization (ISO).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 MAY 1994
TO
IS 1884 : 1993 ATOMOTIVE VEHICLES — ELECTRIC HORNS — SPECIFICATION

(Third Revision)

(*Page* 5, *clause* **6.1**) — Substitute '12 V ac rms' *for* '22 V ac rms'.

(*Page* 7, *clause* **8.6.7.2**) — Substitute the following for the existing:

'a) 85 dB for Type 1 horns,

b) 90 dB for Type 2A horns,

c) 100 dB for Type 2B horns, and

d) 105 dB for Type 3 horn.'

(TED 11)

Indian Standard

AMENDMENT NO. 2 MARCH 2003
TO
IS 1884 : 1993 AUTOMOTIVE VEHICLES —ELECTRIC HORNS —SPECIFICATION

(Third Revision)

(*Page* 2, *clause* **5.1**) — Delete first sentence.

(*Page* 5, *clause* **6.1**) — Substitute 'Maximum rated current, 5 Ampere for 4 Ampere, *for* 'Type 2 B electric horns for rated voltage 12 V dc.'

(*Page* 6, *clause* **8.1.2**) —Delete '(f) Insulation resistance (humid) test (*see* **8.7**)'.

(*Page* 8, *clause* **8.8.4**) — Substitute the last sentence with the following:

'During the test the horn may be ventilated by an air current having a speed of not more than 10 m/s'.

(TED 11)

2—86 BIS/ND/07

Indian Standard

AUTOMOTIVE VEHICLES — ELECTRIC HORNS — SPECIFICATION

(Third Revision)

1 SCOPE

This standard specifies the mechanical, electrical and acoustical requirements, methods of tests for 6, 12 and 24 V electric horns for use in motor vehicles including those intended for two and three wheelers.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
269 : 1989	Specification for 33 grade ordinary portland cement (*fourth revision*)
9000 (Part 2/Sec 1 to 4) : 1977	Basic environmental testing procedures for electronic and electrical items: Part 2 Cold test
9000 (Part 3/Sec 1 to 5) : 1977	Basic enviromental testing procedures for electronic and electrical items: Part 3 Dry heat test
9000 (Part 8) : 1981	Basic environmental testing procedures for electronic and electrical items: Part 8 Vibration (sinusoidal) test
9000 (Part 15/Sec 7) : 1982	Basic environmental testing procedures for electronic and electrical items : Part 15 Sealing test, Section 7 Immersion test
9779 : 1981	Sound level meters
10250 : 1982	Specification for severities for environmental tests for automotive electrical equipment

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Rated Voltage

The voltage assigned to the electric horn by the manufacturer and marked on it.

3.2 Mounting Arrangement

The means of fixing the electric horn on the vehicle.

3.3 ac Horn

A horn designed to operate by alternating current supply, for example, that used in scooters and mopeds employing magneto system.

3.4 dc Horn

A horn designed to operate by direct current supply, for example, that used in passenger cars and trucks.

3.5 High Frequency Horn

The type of horn in which sound is produced by an electromagnetically vibrated diaphragm in conjunction with a tone disc or resonator which vibrates at higher frequency.

3.6 Wind Tone Horn

The type of horn in which sound is produced by an electromagnetically vibrated diaphragm which sets in motion the column of air in the horn flare.

3.7 Insulated Return Horn

A horn in which both the input terminals are insulated from the body.

3.8 Earth Return Horn

A horn in which one of the input terminals is earthed.

3.9 Type Tests

Tests carried out to prove conformity with this specification. These are intended to prove the general qualities and design of a given type of electric horn.

3.10 Acceptance Tests

Tests carried out on the samples taken from the lot for the purpose of acceptance of the lot.

3—86 BIS/ND/07

3.11 Routine Tests

Tests carried out on each electric horn to check the requirements which are likely to vary during production.

4 CLASSIFICATION

The automotive electric horns are classified based on either the design or the environmental requirements.

4.1 Based on the design, the horns are classified into the following types:

Type 1 — ac horns of high frequency type primarily intended for mopeds, scooters and motor cycles employing magneto system

Type 2A — dc horns of high frequency type intended for two and three wheelers using storage battery

Type 2B — dc horns of high frequency type intended for passenger cars and commercial vehicles employing dc system

Type 3 — dc horns of wind tone type intended for passenger cars and commercial vehicles

NOTE — Horns under Types 2 and 3 employed either singly or in matched pairs.

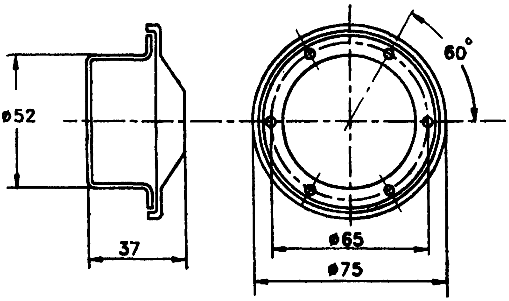
4.2 Based on the environmental requirements, the horns are also classified as follows:

a) *Water Spray Proof Horns* — Horns protected sufficiently to operate satisfactorily under water spray created by wet road and weather conditions, and

b) *Water Sealed Horns* — Horns protected sufficiently to prevent water from entering the horn when the horn is fully submerged under water.

5 SHAPE AND DIMENSIONS

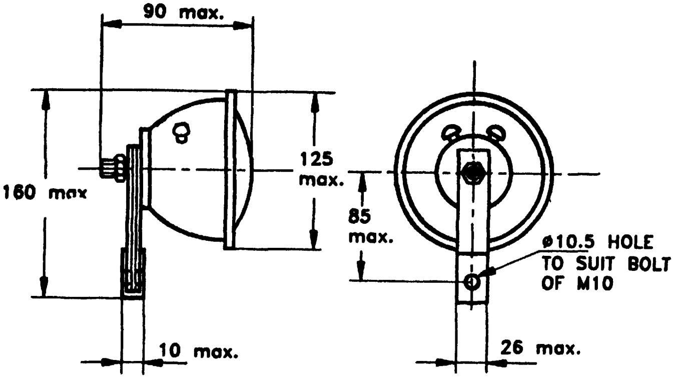
5.1 Typical shapes of horns of Types 1, 2A, 2B and 3 are shown in Fig. 1 to 5. The dimensions including those for mounting shall be agreed upon between purchasers and suppliers.



NOTE — Mounting bracket enabling fixing of bolt size M 8 may be provided.

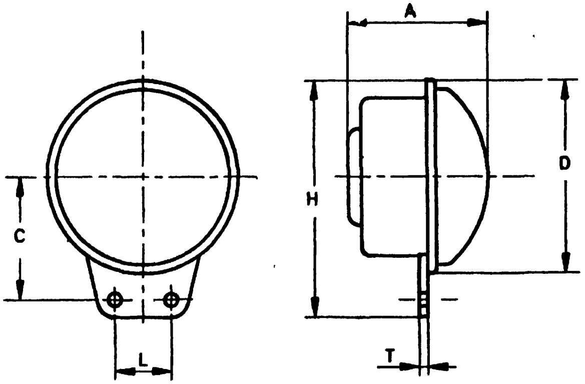
All dimensions in millimetres.

FIG. 1 TYPE 1 HORN (TYPICAL)



All dimensions in millimetres.

FIG. 2 TYPE 2A HORN (TYPICAL)

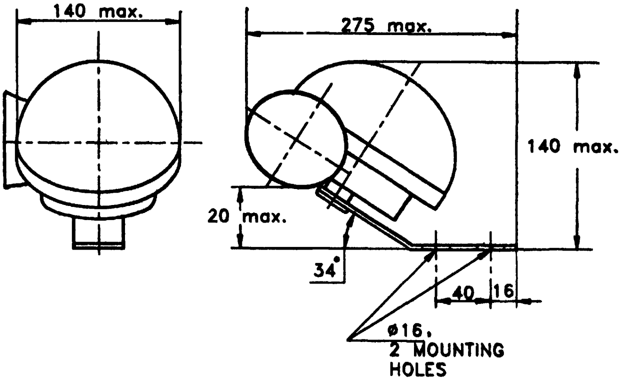


Size of Horn	*A* *Max*	*C* *Max*	*D* *Max*	*H* *Max*	*T* *Max*	*L* *Max*	Thread for Fixing Screws
Small	75	60	100	120	5	30	M6
Medium	90	85	125	160	10	30	M6
Large	125	85	160	180	10	30	M6

NOTE — Alternate provision for a mounting bracket enabling fixing with a bolt of size M10 may be provided.

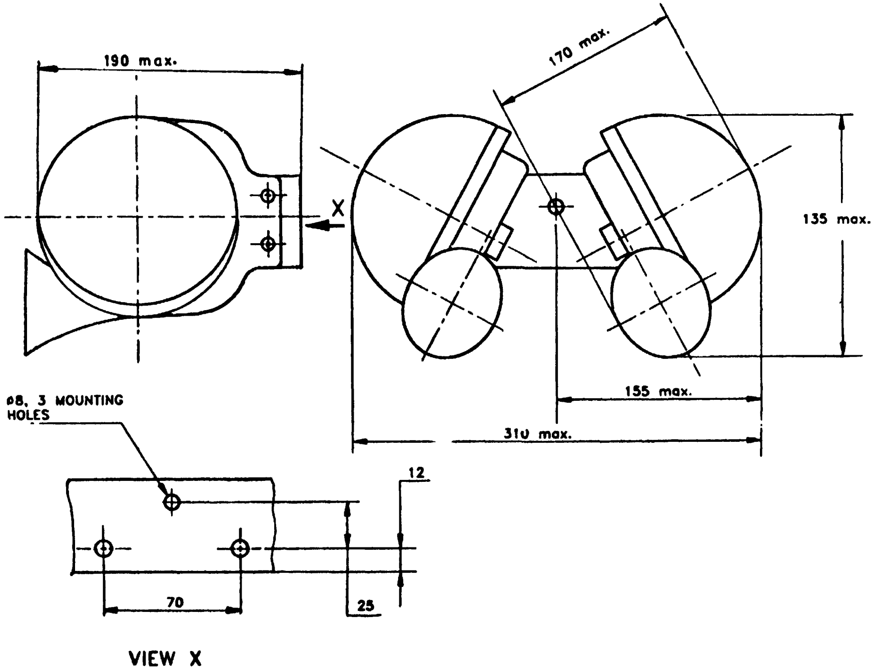
All dimensions in millimetres.

FIG. 3 MOUNTING OF TYPE 2B HORN TYPICAL



All dimensions in millimetres.

FIG. 4 TYPE 3 HORN — SINGLE (TYPICAL)



All dimensions in millimetres.

FIG. 5 TYPE 3 HORN MATCHED PAIR (TYPICAL)

6 RATED VOLTAGE AND MAXIMUM CURRENT

6.1 The values of current ratings for electric horns shall be as follows:

Rated Voltage	*Maximum Rated Current Amperes*			
	Type 1	Type 2		Type 3
		2A	2B	
24 V dc	—	—	3	6
12 V dc	—	2·5	4	10
6 V dc	—	3	8	15
6 V ac rms	3·5	—	—	—
22 V ac rms	3·5	—	—	—

7 SAMPLING

7.1 A recommended plan on sampling for acceptance tests and the criterion for conformity is given in **7.1.1** to **7.1.3**.

7.1.1 If statistical quality control techniques have been used for production control such test results and relevant charts may be made available along with the material supplied to enable the purchaser to judge the acceptability or otherwise of a lot. In case such information is not available, the following procedure is recommended for judging conformity of a lot with the requirements of this specification.

7.1.2 *Scale of Sampling*

7.1.2.1 *Lot*

In any consignment, all the horns of the same size and type and from the same batch of manufacture shall be grouped together to constitute a lot.

7.1.2.2 The number of horns to be selected from a lot shall depend upon the lot size and shall be in accordance with col 1 and 2 of Table 1.

7.1.2.3 These horns shall be selected at random. In order to ensure randomness, the following procedure may be adopted:

> Arrange the horns in a systematic manner and starting from any horn count them as 1,2,...... ...etc, up to *r*, *r* being equal to the integral part of *N*/*n*, *N* being the lot size and *n* the sample size. Every *r*th horn shall be included in the sample.

7.1.3 *Number of Tests*

7.1.3.1 All the horns selected under **7.1.2.2** shall be subjected to acceptance tests.

Table 1 Size of Sample and Criterion for Conformity

(*Clauses* 7.1.2.2 *and* 7.1.4.1)

Lot Size *N* (1)	Sample Size *n* (2)	Permissible Number of Defectives (3)
51 to 150	5	0
151 to 300	13	1
301 to 500	20	1
501 to 1 000	32	2
1 001 and above	50	3

NOTE — For the lot size up to 50 the sample size and the permissible number of defectives shall be as agreed upon between the manufacturer and the purchaser.

7.1.4 *Criterion for Conformity*

7.1.4.1 A lot shall be considered as conforming to this specification, if the number of horns out of those tested, failing to satisfy the requirements of any one or more of acceptance tests, does not exceed the corresponding number given in col 3 of Table 1.

8 TESTS

8.1 Classification of Tests

8.1.1 *Type Tests*

The following shall constitute type tests:

a) Visual examination and dimensional check (*see* **8.2**),

b) High voltage test (*see* **8.3**),

c) Current draw test (*see* **8.4**),

d) Operating voltage range test (*see* **8.5**),

e) Sound pressure level test (*see* **8.6**),

f) Insulation resistance (humid) test (*see* **8.7**),

g) Endurance test (*see* **8.8**),

h) Vibration test (*see* **8.9**),

j) Corrosion resistance test (*see* **8.10**),

k) Continuous operation test (*see* **8.11**),

m) Dust test (*see* **8.12**),

n) Damp heat (cycling) test (*see* **8.13**),

p) Water spray proof test* (*see* **8.14**),

q) Water sealing test* (*see* **8.15**), and

r) Temperature stability test (*see* **8.16**).

Sequence of Tests for Type Approval

Test	*Sequence* 1	2	3	4	5	6	7	8	9
Visual examination and dimensional check	X	X	X	X	X	X	X	X	X
High voltage test	X	X	X	X	X	X	X	X	X
Current draw test	X	X	X	X	X	X	X	X	X
Operating voltage range test	X	X	X	X	X	X	X	X	X
Sound pressure level test	X	X	X	X	X	X	X	X	X
Insulation resistance (humid) test	X								
Endurance test		X	X	X					
Vibration test					X				
Corrosion resistance test						X			
Continuous operation test							X		
Dust test							X		
Damp heat (cycling) test							X		
Water spray proof test if applicable								X	
Water sealing test if applicable								X	
Temperature stability test									X

8.1.1.1 *Criteria for approval*

At least nine samples shall be submitted for testing together with the relevant data. These shall be tested according to the sequence of tests given in **8.1.1.2**. The testing authority shall issue a type approval certificate if the horns are found to comply with the requirements of tests given in **8.1.1**.

8.1.1.2 In case of failure in one or more type test, the testing authority may call for fresh samples not exceeding twice the number of original samples and subject them to the test(s) in which failure occurred. If in repeat test(s) no failure occurs, the tests may be considered to have been satisfied.

8.1.2 *Acceptance Tests*

The following shall constitute acceptance tests:

a) Visual examination and dimensional check (*see* **8.2**),

b) High voltage test (*see* **8.3**),

c) Current draw test (*see* **8.4**),

d) Operating voltage range test (*see* **8.5**),

e) Sound pressure level test (*see* **8.6**), and

f) Insulation resistance (humid) test (*see* **8.7**).

8.1.2.1 *Sampling plan and criteria for approval*

The number of samples for acceptance tests shall be as agreed upon between the manufacturer and the purchaser. However, a recommended sampling plan, along with criteria for approval, is given in **7.1.1** to **7.1.3**.

8.1.3 *Routine Tests*

The following shall constitute the routine tests:

a) Visual examination and dimensional check (*see* **8.2**),

b) Current draw test (*see* **8.4**), and

c) Operating voltage range test (*see* **8.5**).

8.2 Visual Examination and Dimensional Check

8.2.1 The horns shall be examined for the external finish, workmanship and marking.

8.3 High Voltage Test

An ac voltage of 240 rms at a frequency between 40 and 60 Hz shall be applied between the insulated terminals and the body for a period of five seconds. In case of earth return horns the test piece shall be isolated from the condensers, if any, and the internal ground. For earth return horns one such horn in a lot sampled shall be tested for high voltage test and rest of the horns be subjected to other tests.

8.3.1 *Requirement*

The horn shall withstand this test without arcing or puncture indicative of insulation breakdown.

NOTE — Before carrying out the high voltage test, the unit under test shall be cleaned and thoroughly dried. The high voltage test shall be conducted with caution, as repeated application of the test voltage on the same unit may injure the insulation and thereby reduce the safety factor. If for any reason, it is desired to conduct additional high voltage test, the test voltage shall be reduced to 200 V rms. Before applying the supplementary high voltage, the unit under test should be cleaned and thoroughly dried up.

8.4 Current Draw Test

The horn shall be subjected to the rated voltage and the current consumption shall be noted.

8.4.1 The current drawn by each horn shall not exceed the values given in **6.1**.

8.5 Operating Voltage Range Test

8.5.1 The horn at ambient temperature shall operate satisfactorily over the following voltage.

Rated Voltage of Horn	*Performance Limits of Voltage*	
	Maximum	Minimum
V	V	V
(1)	(2)	(3)
24	30·0	22·0
12	14·5	10·0
6	8·0	5·5

NOTE — The requirements specified in **8.5.1** shall be applicable for dc horns only. However, for ac horns the operating range shall be as agreed upon between the manufacturer and the purchaser.

8.6 Sound Pressure Level Test

8.6.1 *Mounting of the Horn*

The horn shall be mounted in the manner specified by the manufacturer and shall be fixed in a rigid manner on a base whose mass shall be at least ten times that of the horn and not less than 15 kg.

8.6.2 The supply voltage shall be 6·5 ± 0·1, 13 ± 0·1 or 26 ± 0·1 V at the terminals of the source of electrical energy corresponding respectively to rated voltage of 6, 12 or 24 V. The resistance of the connecting leads excluding any switch contact in circuit shall be not greater than 0·05, 0·10, and 0·20 ohm for rated votage of 6, 12 and 24 V respectively.

8.6.3 In case of horns of Type 1 operated by an ac supply, the power shall be supplied by a generator of the vehicle for which the horn is intended. The sound pressure level of the horn shall be recorded for generator speeds varying within the range between the maximum speed indicated by the vehicle manufacturer for continuous running and 30 percent of the speed with and without any other electrical load on the generator during the test.

8.6.4 This test may be carried out under the prevailing atmospheric conditions and the level of the background noise shall be such that the reading indicated on the meter by the noise is at least 10 dB below that produced by the horn under test (*see* Note under **8.6.7.1** for reference level). This test may be carried out either in an anechoic room or in an open space in which there is no obstacle within a radius of 12 m and no acoustical focussing effects on nearby parallel walls, the horn being mounted 1·2 m above the ground and directed horizontally.

8.6.5 The horn shall be mounted in such a manner that the sound waves emitted from the horn are directed towards the microphone of the sound level meter in the horizontal plane. The microphone shall be placed in such a manner that it is on the axis of the radiating horn and that the sound waves are incident parallel to the diaphragm. For this test weighting network curve '*A*' on the sound level meter shall be used (*see also* IS 9779 : 1981).

8.6.6 The microphone of the sound level meter shall be at a distance of 2 m from the front of the horn designated by the manufacturer. The microphone shall be shifted sideways or up and down so as to obtain the highest possible meter reading.

8.6.7 *Requirement*

8.6.7.1 The measured sound pressure level of the horn shall be within the following limiting values:

a) 85 to 105 dB for Type 1 horns,

b) 90 to 115 dB for Type 2A horns,

c) 100 to 125 dB for Type 2B horns, and

d) 105 to 125 dB for Type 3 horns.

NOTE — These values for sound pressure level are expressed in relation 2×10^{-5} N/m^2 (rms) weighted in accordance with the Curve '*A*' and expressed in dB (*A*).

8.6.7.2 The sound pressure level within the frequency band of 1 800 to 3 550 Hz shall be greater than that of each component of a frequency exceeding 3 550 Hz and in any case equal to or greater than:

a) 85 to 105 dB for Type 1 horns,

b) 90 to 115 dB for Type 2A horns,

c) 100 to 125 dB for Type 2B horns, and

d) 105 to 125 dB for Type 3 horns.

8.7 Insulation Resistance (Humid) Test

The horn shall be kept in suitable humidity chamber with a relative humidity not less than 95 percent at a temperature of 50 to 60°C for a duration of 48 hours. The insulation resistance shall then be measured at 500 V dc for one minute, after wiping away the extraneous moisture. The test piece shall be isolated from condensers, if any, and the internal ground, in case of earth return horns.

8.7.1 *Requirement*

The insulation resistance shall be not less than one mega ohm.

8.8 Endurance Test

8.8.1 The horn shall be mounted in the manner specified by the manufacturer and shall be fixed in a rigid manner on a base whose mass shall be at least ten times that of the horn and not less than 15 kg.

8.8.2 The voltage at the horn terminals shall be 6·5 ± 0·2, 13 ± 0·3 and 26·0 ± 0·5 V for rated voltages 6, 12 and 24 V respectively. For Type 1 ac horns operation the power shall be supplied by the generator of the vehicles for which the horn is intended or the test shall be carried out with a generator of similar design with speeds agreed mutually between the manufacturers and the purchasers. The resistance in the systems including the resistance at terminals and contacts shall be less than 0·05, 0·10 and 0·20 ohms for rated valtages of 6,12 and 24 V respectively.

8.8.3 If several horns are tested simultaneously appropriate precautions must be taken so that operation does not result in mutual interference. It shall be ensured that the support of the various horns are mechanically isolated from each other or if they are mounted on the same support, they shall be operated one after the other instead of simultaneous operation.

8.8.4 The horn shall be operated for 100 000 cycles and there shall be no significant change in volume and tone of the horn with a maximum of three adjustments. Each cycle shall consist of ON for one second and OFF for three seconds. During the test the horn shall be ventilated by an air current having a speed of about 10 m/s.

8.8.5 *Requirements* — After 100 000 cycles, the horn shall be subjected to sound pressure level test (*see* **8.6**). If necessary the horn may be adjusted without dismantling during the test. The drop in sound pressure level shall not exceed 5 dB below that measured before the endurance test. The horns shall also satisfy the current draw test specified in **8.4**.

8.9 Vibration Test

The test shall be carried out as specified in IS 9000 (Part 8) : 1981 with the following severities:

Frequency range	10-55 Hz
Displacement amplitude	0·75 mm
Total duration	3 hours

8.9.1 *Requirement*

After the vibration test, the horn shall be subjected to sound pressure level test (*see* **8.6**). The depreciation in the sound output shall be not more than 5 dB from the initial value. The horn shall also satisfy the current draw test specified in **8.4**.

8.10 Corrosion Resistance Test

The test shall be carried out as specified below.

8.10.1 *Test Apparatus*

8.10.1.1 *Salt spray chamber*

The chamber for this test shall be so constructed that the salt spray is produced in the lower part of the chamber, in the upper part of which the parts to be exposed are suspended. The construction of the ceiling, walls and other parts of the chamber shall be such that no condensate can drip on the test specimen. The spray shall be produced by an atomizer employing compressed air free from all impurities.

In general, a salt spray chamber shown in Fig. 6 with a spraying arrangement as shown in Fig. 7 and complying with the following requirements would be suitable:

a) The cabinet shall approximately be of the dimensions shown, and the cabinet and its internal fittings shall be made of monel metal or other suitable material. A shelf capable of being fitted in the upper or lower part of the cabinet shall be provided.

b) The air used for atomizing the salt solution shall be clean. It shall be possible to adjust the pressure by a relief valve or by the pressure outlet of the blower.

c) It shall be possible to control the amount of spray by adjusting the position of the lower nozzle *C* by unscrewing the bottom locknut *B*. The diameter of nozzle shall be 1·5 mm. A tap and second branch in the air-line shall be available for agitating the salt solution as required.

d) The spraying apparatus shall be capable of atomizing not less than 1 450 ml salt solution per hour. The quality of solution sprayed per cubic metre capacity of the chamber shall be approximately 175 ml per minute, and

e) A container filled with cotton wool shall be provided as shown in Fig. 7. It acts as a breather and provides an outlet for the air which is constantly being pumped into the chamber, the cotton wool acting as a filter and preventing salt mist from being discharged into the atmosphere.

8.10.2 *Test Procedure*

The nozzle for atomizing the salt solution shall be adjusted for maximum amount of spray.

The pressure of the solution shall be maintained between 29 and 35 kPa.

The test piece shall be sprayed in the chamber with five percent solution of sodium chloride in water at the standard temperature of 27 ± 2°C for 50 hours consisting of two periods, each period being of 24 hours of spraying and one hour of draining.

8.10.3 *Requirement*

After removal from the salt spray, that is, within two hours after draining and again when tested 24 h later, the horn shall satisfy the requirements of the sound pressure level test (*see* **8.6**). The depreciation in the sound pressure level shall be not more than 5 dB from the initial value.

8.10.3.1 The appearance of the horn shall not prejudice to the assessment of results.

8.10.3.2 After removal from the salt spray chamber, the horn shall not show any sign of corrosion or electrolytic action.

8.11 Continuous Operation Test

With a terminal voltage of 6·5 ± 0·1 V, 13 ± 0·2 V for 26 ± 0·4 V as appropriate, the horn shall be continuously operated for a period of five minutes and then allowed to cool to ambient temperature.

For horns of Type 1 operated by ac power, the power shall be supplied by a generator of the vehicle for which the horn is intended and the test shall be carried out at a frequency speed agreed to between manufacturers and purchasers.

8.11.1 *Requirement*

The horn shall then satisfy the sound pressure level test (*see* **8.6**).

8.12 Dust Test

The horn shall be mounted in its normal operating position, 150 mm from the wall in a box measuring 900 mm in all directions, containing 5 kg of fine powdered cement conforming to IS 269 : 1989. At intervals of 15 minutes this dust shall be agitated by compressed air or fan blower by projecting blasts or air for a two second period in a downward direction into the dust in such a way that the dust shall be completely and uniformly diffused throughout the entire box. The dust is then allowed to settle. This test shall be continued for five hours.

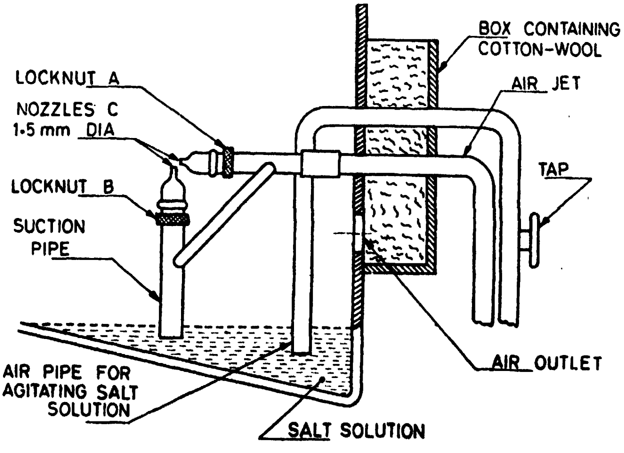
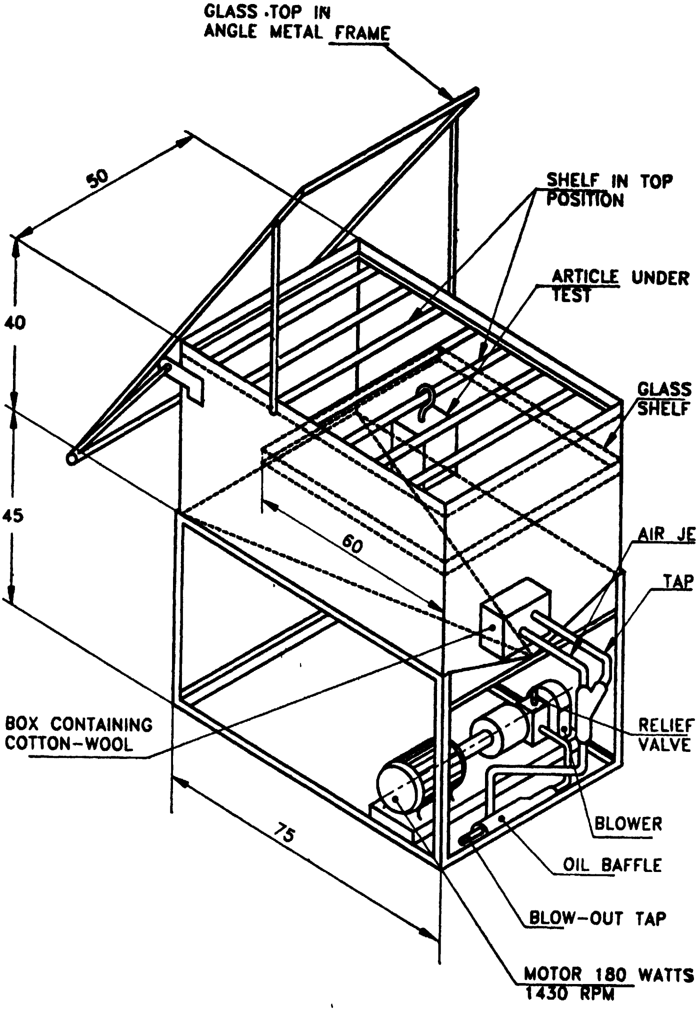


FIG. 6 SALT SPRAY CHAMBER



All dimensions in millimetres.

FIG. 7 DETAILS OF SPRAYING ARRANGEMENT

8.12.1 *Requirement*

After the completion of the test, the horn shall be subjected to the sound pressure level test (*see* **8.6**). The depreciation in the sound pressure level shall be not more than 5 dB from the initial value.

8.13 Damp Heat (Cycling) Test

The damp heat (cycling) test shall be carried out according to Group 2 of IS 10250 : 1982. The number of conditioning cycles and the recovery period shall be 7 and 24 hours respectively.

8.13.1 *Requirement*

After the completion of the test, the horn shall be subjected to the sound pressure level test (*see* **8.6**). The depreciation in the sound pressure level test shall be not more than 5 dB from the initial value.

8.14 Water Spray Proof Test

The object of this test is to determine the suitability of the horn to withstand conditions of water spray.

8.14.1 The sample horn shall be attached by its bracket to a rigid structure in the position recommended by the manufacturer, for horizontal projection of the sound waves. The horns shall be subjected to a precipitation of 2·54 mm of water per minute directed downwards at an angle of 45° in the form of a spray. During the water spray test, the unit shall resolve about the vertical axis at a rate of four revolutions per minute. This test shall be continued for 6 hours. The unit shall then be allowed to drain for 1 hour.

8.14.2 *Requirement*

At the end of the test, the horn shall function satisfactorily and shall pass the sound pressure level test (*see* **8.6**). The depreciation in the sound pressure level shall be not more than 5 dB from the initial value. Strip examination shall show no evidence of water ingress into the contact breaker and coil housing.

8.15 Water Sealing Test

This test shall be applicable to water sealed horns only.

8.15.1 The test shall be conducted in accordance with IS 9000 (Part 15/Sec 7) : 1982 for a period of five minutes. The horns shall be completely immersed to a depth of 15 cm.

8.15.2 *Requirement*

At the end of the test, the horn shall function satisfactorily and shall pass the sound pressure level test (*see* **8.6**). The depreciation in the sound pressure level shall be not more than 5 dB from the initial value. Strip examination should show no evidence of water ingress into the contact breaker and coil housing.

8.16 Thermal Stability Test

The following tests shall be performed on horns:

a) Dry heat test, and

b) Cold test.

8.16.1 *Dry Heat Test*

This test is intended to determine suitability of equipment to withstand high temperature severities which are likely to be encountered when mounted on a vehicle.

The test shall be conducted as specified in IS 9000 (Part 3/Sec 1) : 1977.

The equipment shall be tested for high temperature use at the following conditions :

	Group 2
Temperature, °C	70/55
Duration of exposure, hours	4/16

8.16.2 *Cold Test*

This test is intended to determine the suitability of the equipment at the specified low temperature likely to be encountered when mounted on a vehicle.

The test shall be conducted as specified in IS 9000 (Part 2/Sec 1 to 4) : 1977.

The equipment shall be tested for low temperature use at the following conditions:

Temperature	–10°C
Duration of exposure	2 hours

8.16.3 *Requirement*

After the test, the horn shall be allowed to return to ambient temperature and shall be subjected to sound pressure level test (*see* **8.6**). The depreciation in the sound pressure level shall be not more than 5 dB from the initial value.

9 MARKING

9.1 The horn shall be provided with a name plate or marking, which shall convey the following information:

a) Trade-name or name of the manufacturer,

b) Type number,

c) Rated voltage,

d) Month and year of manufacture, and

e) Country of manufacture.

GMGIPN—86 BIS/ND/07—100

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. TED 11 (041).

Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.org.in

Regional Offices:

		Telephones
Central :	Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	2323 7617 2323 3841
Eastern :	1/14, C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700 054	2337 8499, 2337 8561 2337 8626, 2337 9120
Northern :	SCO 335-336, Sector 34-A, CHANDIGARH 160 022	260 3843 260 9285
Southern :	C.I.T. Campus, IV Cross Road, CHENNAI 600 113	2254 1216, 2254 1442 2254 2519, 2254 2315
Western :	Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	2832 9295, 2832 7858 2832 7891, 2832 7892

Branches: AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

PRINTED BY THE GENERAL MANAGER GOVERNMENT OF INDIA PRESS, NASHIK